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ABSTRACT

The present study and a replication investigated the effects of personality variables on test scores obtained under Answer Every Item (AEI), Do Not Guess (DNG) and Coombs' Type (CT) directions. Subjects were administered a dominance scale and extreme scorers randomly assigned to one of the types of directions, then randomly assigned to complete an anxiety scale either before or after a multiple choice vocabulary test. In the initial study, dominant individuals scored significantly higher than submissive subjects under CT and AEI directions. Low anxious subjects scored significantly higher under DNG and AEI directions, while differences under CT instructions were nonsignificant. Level of anxiety was significantly lower after the vocabulary test under AEI and CT directions, but remained the same under DNG directions. The results were less clear-cut in the replication, but relationships among variables were, for the most part, consistent with the initial study. It appears submissive, anxious individuals operate at a disadvantage in testing situations which allow some freedom in responding. (Author)

TEST DIRECTIONS AND STUDENT PERSONALITY

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The present study and a replication investigated the effects of personality variables on test scores obtained under Answer Every Item (AEI), Do Not Guess (DNG) and Coombs' Type (CT) directions. Subjects were administered a dominance scale and extreme scorers randomly assigned to one of the types of directions, then randomly assigned to complete an anxiety scale either before or after a multiple choice vocabulary test. In the initial study, dominant individuals scored significantly higher than submissive subjects under CT and AEI directions. Low anxious subjects scored significantly higher under DNG and AEI directions, while differences under CT instructions were nonsignificant. Level of anxiety was significantly lower after the vocabulary test under AEI and CT directions, but remained the same under DNG directions. The results were less clear-cut in the replication, but relationships among variables were, for the most part, consistent with the initial study. It appears submissive, anxious individuals operate at a disadvantage in testing situations which allow some freedom in responding.

A number of studies have concluded that performance in certain types of testing situations, e.g. under an announced penalty for guessing, may be moderated by personality variables (Swineford, 1938, 1941; Johnson, 1941; Hammerton, 1965; Taylor, 1965; Slakter, 1968). Few studies have examined the validity of derived indices purporting to reflect the operation of these variables by examining their relationship with independent

measures of personality. An extensive review of the literature revealed only two published studies: Votaw, 1936 and Sherriffs and Boomer, 1954.

Votaw found that Ss characterized as submissive and of low ability omitted significantly more items under do-not-guess (DNG) directions than did ascendant or high ability Ss, but all groups were equally capable of answering omitted items when forced to do so.

Sherriffs and Boomer found that Ss rated as overly anxious and upset tended to omit a significantly greater number of items than "well adjusted" Ss under an announced guessing penalty, and, when required to do so, the former group could correctly answer a greater number of omitted items than could the latter group.

These studies lend credence to the hypothesis that test performance is moderated by personality factors, and situations in which the examinee is given some latitude in responding may be substantially biased against certain Ss.

A test administration and scoring procedure suggested by Coombs (1953) appears to have several advantages over DNG and answer-every-item (AEI) instructions. Known as Coombs' type directions (CTD), Ss identify incorrect rather than correct options. Typically, each correct identification is worth 1 point. Identification of the correct answer as incorrect results in a penalty of n-1 points, where n is the number of options. Under CTD, Ss obtain partial credit for partial knowledge, they can be required to consider all items and a penalty for guessing is incorporated.

However, the possibility exists that the problems noted by Votaw, and Sherriffs and Boomer have merely been shifted from the intact

item to the items' options.

The present study and a replication investigated the performance of Ss categorized as dominant or submissive and high or low test-anxious under AEI, DNG, and CTD instructions. Test-taking as an anxiety producing experience was also investigated.

Method

Ss were 120 graduate students enrolled in an introductory educational research course at the University of Pittsburgh. During the first weeks of the term, a 26 item true-false dominance scale, based on Edwards-type items, (Edwards, 1953), was administered to all Ss. Extreme scorers ($13 \leq X \leq 9$) were then randomly assigned to one of three types of test situations; AEI, DNG or CTD. Ss were then randomly assigned to complete an 18 item test anxiety scale, based on Sarason-type items,[1] either before[2] or after completing a 100 item multiple-choice vocabulary test, based on the Quick Word Test (Borgatta and Corsini, 1951).

The study was later replicated using under-graduate student teachers.

Results

The results obtained in the initial study follow. The results of the replication are summarized in the attached appendix.

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[1] Personal Communication, Irwin G. Sarason, February 10, 1968.

[2] "Before" Ss were first informed of the type of directions they would be employing, and the scoring procedure.

Table 1 summarizes the vocabulary test scores for Ss categorized as dominant or submissive, under the three types of instructions.

TABLE 1

Vocabulary Scores of Dominant and Submissive Ss, Under Three Types of Instructions

Personality	DNG			AEI			CTD		
Classification	n	$\bar{x}$	s.d.	n	$\bar{x}$	s.d.	n	$\bar{x}$	s.d.
Dominant	9	53.0	4.97	9	65.8	11.02	9	157.0	68.7
Submissive	9	48.0	10.38	9	45.3	9.05	10	90.7	40.6

CTD scores represent the summation of item scores which can range from -(n-1) to +(n-1) points. Therefore, a two-way ANOVA was employed with the DNG and AEI data and a t-test was employed with the CTD data.

The two-way ANOVA revealed no significant main effect attributable to directions (AEI versus DNG), but there were effects attributable to personality, as well as a significant interaction. (See Table 2)

TABLE 2

Two-way ANOVA Testing Effects of Dominant-Submissive Characteristics and AEI and DNG Directions on Vocabulary Test Scores

Source	df	MS	F
Directions (A)	1	196.0	2.33
Personality (B)	1	1369.0	16.29*
A x B	1	608.9	7.24*
Within	32	84.1	

*$p < .05$

The t-test on the CTD data showed dominant Ss performed significantly better than did submissive Ss. (See Table 3)

TABLE 3

t-test on Vocabulary Scores Obtained Under CTD for Dominant and Submissive Ss

Variable	n	$\bar{x}$	s.d.	t
Dominant	9	157.0	68.7	2.59*
Submissive	10	90.7	40.6	

*$p < .05$, one-tailed test

Table 4 summarizes the performance of Ss identified as high or low test anxious prior to their completing the vocabulary test under

the three types of directions

TABLE 4

Summary of the Vocabulary Scores of High and Low Test-anxious Ss under Three Types of Directions

Test Anxiety	DNG			AEI			CTD		
	n	$\bar{x}$	s.d.	n	$\bar{x}$	s.d.	n	$\bar{x}$	s.d.
High	6	47.2	10.05	6	53.0	10.37	12	114.5	55.0
Low	6	51.7	18.4	6	71.0	10.9	10	121.9	43.6

A two-way ANOVA on the data obtained under DNG and AEI directions resulted in a significant F for both level of test anxiety and type of directions. The interaction was nonsignificant. (See Table 5)

TABLE 5

Two-way ANOVA Testing Effects of Level of Test Anxiety and DNG and AEI Directions

Source	df	MS	F
Test directions (A)	1	1014.0	6.11*
Level of test anxiety (B)	1	816.7	4.92*
A x B	1	308.2	1.85
Within	20	165.9	

*$p < .05$

A t-test on the differences in performance noted under CTD by high and low test-anxious Ss showed the difference to be nonsignificant. (See Table 6)

TABLE 6

t-test on the Effects of

Test Anxiety on Performance Under CTD

Test Anxiety		CTD		
	n	$\bar{x}$	s.d.	t
High	12	114.5	55.0	-0.34
Low	10	121.9	43.6	

To examine the process of test-taking under different directions as an anxiety-producing experience, a two-way ANOVA was performed on a random sample of Ss who had completed the test anxiety scale either before or after completing the vocabulary test. There were significant differences attributable to both type of direction and time of measurement of test anxiety. There was no significant interaction. (See Tables 7 and 8)

TABLE 7

Anxiety Scores Obtained Under Three Types

of Directions, Either Before or After Completing the Vocabulary Test

Administration of Scale	DNG		AEI		CTD	
	$\bar{x}$	s.d.	$\bar{x}$	s.d.	$\bar{x}$	s.d.
Before (n=11)	9.2	3.78	10.2	5.03	14.6	3.13
After (n=11)	9.3	2.72	7.2	3.62	11.2	4.41

TABLE 8

Two-way ANOVA Testing Effects of Time,

of Measurement of Test Anxiety and Type of Direction

Source	df	MS	F
Test directions (A)	2	116.3	8.53*
Time of Measurement (B)	1	74.2	5.45*
A x B	2	20.4	1.50
Within	60	13.6	

*$p < .05$

Discussion

Although the results of the replication are not always in support of the initial study at conventional levels of significance, the relationships among variables are quite consistent.

Although the variable was not specifically investigated, the average age of Ss in the two studies differed. This may be partly the reason for inconsistencies noted. Also, there were minor differences in test administration procedures, which might have led to "hypothesis-testing" behavior on the part of Ss in the replication. (e.g. Ss may have expressed "socially-desirable" responses to the test anxiety scale or dominance scale, rather than made "typical" responses.)

The discussion will concentrate, therefore, on the consistencies and similarities between the two studies.

Dominant Ss performed better under AEI and DNG directions in both studies, which might imply that there is a relationship between dominance and ability, i.e. dominant Ss are also the most able. There are implications in Kogan and Wallach's (1967) discussion of risk-taking correlates that would support this hypothesis.

Although the difference was significant in only the initial study, the relationship between the means of dominant and submissive Ss under CTD was maintained in the replication. Dominant Ss are again at an advantage over submissive Ss.

Test anxiety appears closely related to test performance under AEI and DNG instructions; low test-anxious Ss tended to outperform high test-anxious Ss. This finding was more definitive in the initial study but again the relationship among means was consistent in the replication. The same phenomenon was observed with reference to type of test direction; AEI scores tended to be higher than DNG scores. The CTD data are

equivocal. Low test-anxious Ss were at an advantage (although a non-significant one) in the initial study, and at a decided disadvantage in the replication. This is contrary to expectations based on the implications of much related research.

The effects of the test-taking experience on test-anxiety seems most consistent for AEI instructions; the initial study revealed anxiety diminished under AEI instructions, as did the replication. Tentatively, it appears that DNG instructions may increase them (as seen in the replication) and CTD may decrease them.

One of the principal problems with the present study was the small number of subjects available for the various sub-divisions of the data. This may have resulted in analyses of low power. The trends observed, however, may provide thought for additional research into psychological factors effecting test performance. Also the variable of age may be relevant to the variables investigated. The possibility of "hypothesis-testing" behavior by replication Ss, a possibility minimized in the initial study by having different E's administer tests at different times, may have weakened effects in the replication.

One may tentatively conclude that AEI directions allow Ss to maximize their test performance, when compared to DNG instructions. AEI directions also apparently create a less-stressful testing situation. The superiority of the AEI format may be due to familiarity; Ss were naive with reference to CTD and probably not as familiar with DNG as with AEI instructions.

APPENDIX 1

Results of the Replication

The data in the replication were obtained in essentially the same manner as the initial study. However, the study was done with undergraduates rather than graduate students.

TABLE R1

Vocabulary Scores of Dominant and Submissive Ss,

Under Three Types of Instructions

Personality Classification	DNG			AEI			CTD		
	n	$\bar{x}$	s.d.	n	$\bar{x}$	s.d.	n	$\bar{x}$	s.d.
Dominant	8	59.9	19.91	8	74.8	10.37	8	160.8	42.68
Submissive	8	49.1	14.91	8	64.8	15.59	8	139.6	36.92

TABLE R2

Two-way ANOVA Testing Effects of Dominant-Submissive

Characteristics and AEI and DNG Directions on Vocabulary Test Scores

Source	df	MS	F
Directions (A)	1	1860.5	7.67*
Personality (B)	1	861.1	3.55
A x B	1	1.2	0.004
Within	28	242.4536	

*$p < .05$

TABLE R3

t-test on Vocabulary Scores Obtained Under CTD

for Dominant and Submissive Ss

Variable	n	$\bar{x}$	s.d.	t
Dominant	8	160.8	42.68	1.06
Submissive	8	139.6	36.92	

TABLE R4

Summary of the Vocabulary Scores of High and Low

Test-anxious Ss under Three Types of Directions

Test Anxiety	DNG			AEI			CTD		
	n	$\bar{x}$	s.d.	n	$\bar{x}$	s.d.	n	$\bar{x}$	s.d.
High	6	55.7	15.97	6	55.7	12.73	6	191.0	36.77
Low	6	59.3	20.81	6	77.8	9.62	6	140.5	20.65

TABLE R5

Two-way ANOVA Testing Effects of Level of Test Anxiety

and DNG and AEI Directions

Source	df	MS	F
Test directions (A)	1	273.37	1.16
Level of test anxiety (B)	1	651.04	2.76
A x B	1	273.38	1.16
Within	20	235.74	

TABLE R6

t-test on the Effects of Test Anxiety

on Performance under CTD

Test Anxiety	CTD			
	n	$\bar{x}$	s.d.	t
High	6	191.0	36.77	2.94*
Low	6	140.5	20.65	

*p < .05

TABLE R7

Anxiety Scores Obtained Under Three Types of Directions,

Either Before or After Completing the Vocabulary Test

Administration of Scale	DNG		AEI		CTD	
	$\bar{x}$	s.d.	$\bar{x}$	s.d.	$\bar{x}$	s.d.
Before (n=11)	6.3	5.12	11.8	4.91	7.8	6.04
After (n=11)	12.5	4.80	9.2	4.95	7.8	4.53

TABLE R8

Two-way ANOVA Testing Effects of Time of Measurement of

Test Anxiety and Type of Direction

Source	df	MS	F
Test directions (A)	2	21.58	0.83
Time of measurement (B)	1	12.25	0.47
A x B	2	61.58	2.38
Within	30	25.87	

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